Center Innovation Fund: SSC CIF

More Robust Test Stand Operations through Next-Gen Real-Time Analysis of Operations Anomalies

Completed Technology Project (2015 - 2016)

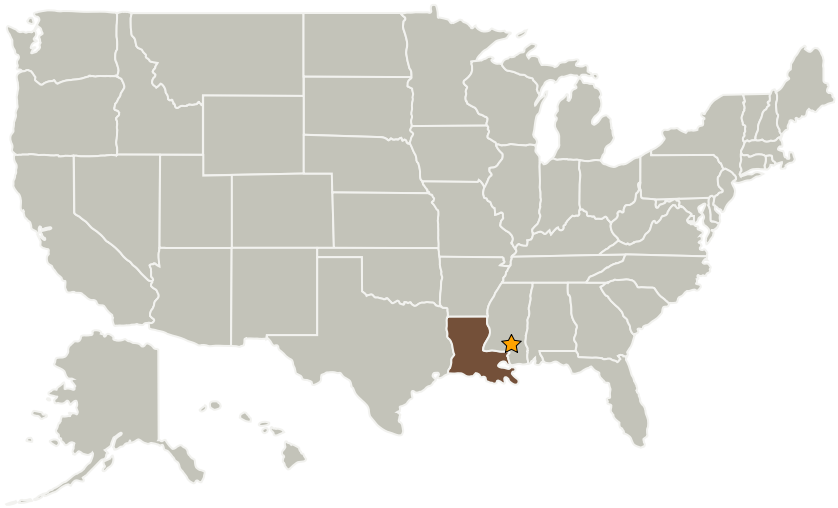
Project Introduction

The Functional Monitoring & Diagnosis (FMD) software (developed by MSC) is a next-generation monitoring & diagnostic software that works by evaluating process data with respect to the system math model. FMD software determines, in real time, the complete state of the system, and thereby whether or not the system and its components are operating as per their specifications and commanded configuration. This is a much deeper analysis than conventional alarm monitoring. The FMD software (also developed by MSC) can determine the full internal state, and determine whether the system and its component are operating per design. The FMD software is comparable to an engineer's analysis with the ability to diagnose an unfamiliar anomaly by using a first-principles model of the system. The FMD software is based on a rigorous formalization of engineering diagnosis. Like the engineer, the software requires system schematics and accompanying mathematics. The system model is comparable to a simulator model and is typically derivable from the calculations performed to size the system key parameters. Often, the math model can be quickly developed using the system schematic, along with generally known math for the system components.

Anticipated Benefits

Benefits to NASA funded missions include improving existing test operations real-time decision knowledge base which is critical for competitiveness of a propulsion systems test providers. The FMD software enables the ability to test a multitude of situations where failures have not occurred, thereby reducing system failures and ultimately cost.

Primary U.S. Work Locations and Key Partners



Technology Transfer Logo

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi

Co-Funding Partners	Type	Location
Model Software Corportation(MSC)	Industry	New Orleans

Primary U.S. Work Locations
Louisiana

Images

More Robust Test Stand Operations through Next-Gen Real-Time Analysis of Operations Anomalies
Technology Transfer Logo
(https://techport.nasa.gov/image/16595)

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

Program Director:
Michael R Lapointe

Program Manager:
Ramona E Travis

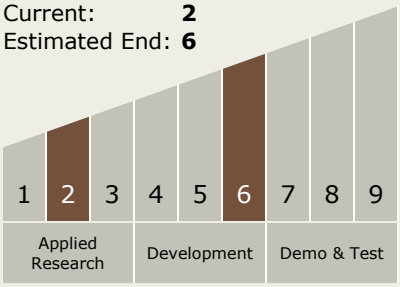
Project Manager:
Harry M Ryan

Principal Investigator:
Ke Nguyen

Co-Investigator:
John Kelly

Technology Maturity (TRL)

Start: **2**
Current: **2**
Estimated End: **6**



Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.5 Thermal Control Analysis